PATENT ABSTRACTS OF JAPAN

(11)Publication number : 09-037203

(43)Date of publication of application : 07.02.1997

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(51)Int.Cl.

H04N 5/91
G01S 5/14
G03B 17/24
H04N 5/225
H04N 5/765
H04N 5/781

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(21)Application number : 07-182763

(22)Date of filing : 19.07.1995

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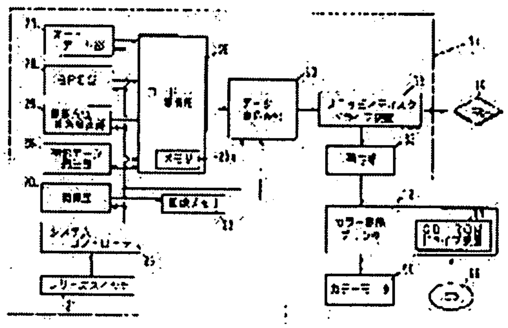
(54) IMAGE PICKUP DEVICE AND IMAGE REPRODUCING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To record or display a pickup district name with a picked-up image through a simplified configuration of a camera.

SOLUTION: A global positioning system(GPS) section 28 is provided to a still video camera 11. The GPS section 28 receives a signal and longitude/ latitude information from an artificial satellite. The longitude/latitude information is stored in a floppy disk 19 with image pickup data. In the case of printing, the longitude/latitude information is read with the image data. A geographical database is retrieved based on the longitude/latitude information to locate an image pickup district name. Furthermore, an object title is decided based on image pickup azimuth information, focal distance information of an image pickup lens. Character of the image pickup date and time, the image pickup district name, and the object title or the like are printed out on a hard copy.



LEGAL STATUS

[Date of request for examination] 06.02.2002

[Date of sending the examiner's decision of rejection]	11.08.2004
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	3844259
[Date of registration]	25.08.2006
[Number of appeal against examiner's decision of rejection]	2004-018340
[Date of requesting appeal against examiner's decision of rejection]	06.09.2004
[Date of extinction of right]	

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] In case this invention records the camera station information which pinpoints a camera station uniquely, bearing information, bearing elevation angle information at the time of photography, etc. and reproduces an image with photography, it relates to the photography equipment and image rendering equipment which displayed or recorded the photography name of a place, the photographic subject theme, etc. with the rendering image.
[0002]
[Description of the Prior Art] The approach of carrying out a photoprint to a photographic film using the camera and this which recorded photography information, such as light source information, Japan-China synchro information, and photography intention information, in the case of photography etc. is proposed (for example, Japanese-Patent-Application-No. No. 113347 [four to] official report). Moreover, it has the global positioning system (GPS) function to judge the current position based on the signal from a satellite, and in case a photograph is taken, time, the location, and the camera with built-in GPS recorded together are proposed (for example, JP,7-64169,A).
[0003] By using the camera which records the various above-mentioned photography information, the high quality print which various photography information was utilized [print] and fully demonstrated the function of a camera and the engine performance of sensitive material comes to be obtained. Moreover, with the above-mentioned camera with built-in GPS, it is recorded in case the exact photography name of a place is photography, and the print photograph with which the photography name of a place was compounded on the occasion of a photoprint comes to be acquired.
[0004]
[Problem(s) to be Solved by the Invention] The photography name of a place beforehand registered based on the lat/long information acquired from the GPS function is searched with the above-mentioned camera with built-in GPS from a geography database, and the corresponding photography name of a place is displayed on the display of a camera. And when this content is sufficient, information, such as the photography name of a place and photography time, will be recorded by operating a predetermined switch. Therefore, it is necessary to memorize a vast quantity of geography databases which related lat/long information and the photography name of a place corresponding to this with the camera side, and the storage capacity to need will become huge. For this reason, there is a problem that mass storage is needed. Moreover, with the above-mentioned camera with built-in GPS, since the photography name of a place is memorized, there is a problem that it cannot use effective in assistance of exposure control of camera station data, specification of the photographic subject theme, etc.
[0005] This invention aims at offering the photography equipment and image rendering equipment which enabled it to pinpoint the photographic subject theme, the location of the sunlight in the case of photography, etc. by displaying a photography location etc. on the photoed screen together moreover based on a GPS function, without using mass storage capacity, and also using combining a photography location, bearing of the exposure axis, the photography information on other, etc.
[0006]
[Means for Solving the Problem] In order to attain the above-mentioned object, the photography equipment indicated to claim 1 is equipped with a means to detect the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal, and the means which writes this camera station information in a record medium. Moreover, photography equipment according to claim 2 is equipped with the means which writes a

means to detect the photography bearing information that photography bearing in the case of photography is pinpointed in a thing according to claim 1, and this photography bearing information and the focal distance information on a taking lens in a record medium with camera station information. Moreover, image rendering equipment according to claim 3 also writes in photography elevation angle information with photography bearing information. Moreover, image rendering equipment according to claim 4 is equipped with a means to determine the photography name of a place from camera station information, and a means to record or display the photography name of a place searched for with a rendering image. Moreover, image rendering equipment according to claim 5 is equipped with a means to determine the photography name of a place from camera station information, a means to specify the photographic subject theme from the focal distance information on a taking lens, and the bearing information at the time of photography, and a means to record or display both the photography name of a places and the photographic subject themes which were searched for with a rendering image. [both / one side or] Moreover, in case image rendering equipment according to claim 6 specifies the photographic subject theme, the photography elevation angle information other than bearing information is used for it.

[0007] In the case of photography, with a still video camera, a photographic subject image is picturized by release actuation by the image area sensor, and this image data is written in the record medium of memory, such as for example, an LSI card, or a floppy disk. Moreover, besides the writing of this image data, with other photography time information, the focal distance information on a taking lens, photography bearing information, etc., the camera station information which pinpoints uniquely the camera station in the case of photography by the GPS function, for example, lat/long information, makes it correspond to a photography coma, and it is recorded on a record medium. When reproducing the photoed image, in the case of a still video camera, the lat/long information on a coma for a print, photography time information, the focal distance information on a taking lens, photography bearing elevation angle information, etc. are read first. And the photography name of a place is specified based on lat/long information. Next, "Mt. Fuji", the "North Alps", etc. are pinpointed, for example as the theme of scenery from photography bearing elevation angle information and the focal distance information on a taking lens. These photography name of a place, the photographic subject theme, etc. are displayed on a display with image data. And the photoed color picture is printed for example, on a color thermal recording ingredient by entering the photography name of a place using video printers, such as a color thermal printer, if needed. In this case, the photography address pinpointed based on lat/long information besides the name of a place may be recorded. Moreover, lat/long information etc. may be recorded with a 8mm video camera. The specification becomes easy, when a photography person performs edit and production of hard copy and it specifies the photographic subject theme especially from the camera station information by the GPS function, and photography bearing information in the case of a still video camera or a 8mm video camera.

[0008]

[Embodiment of the Invention] Drawing 1 is the functional block diagram showing the image rendering system which consists of a color thermal printer 12 which prints an image with the photography name of a place using the still video camera 11 which recorded various photography information with image data, and the data picturized with this still video camera 11 using a floppy disk 10. As everyone knows, the photography section 20 of a still video camera 11 consists of image pick-up optical system and a color image area sensor, by actuation of the release switch 21, picturizes a photographic subject and memorizes this to an image memory 22. Moreover, a focus is performed by the autofocus device on the occasion of photography.

[0009] Sequence control of the image pick-up section 20 and the image memory 22 is carried out by the system controller 23. The system controller 23 records various photography data on the magnetic-recording layer of a floppy disk 10 with image pick-up data while it consists of well-known microcomputers and picturizes by carrying out sequence control of each part by actuation of the release switch 21. The flow chart of the procedure in a system controller 23 is shown in drawing 2 .

[0010] The photography data generating section 26, the auto date section 27, the GPS section 28, and the photography bearing elevation angle detecting element 29 are connected to the code-conversion section 25, and various photography information is inputted into it by these. The photography data generating section 26 generates light source kind information, stroboscope luminescence information, and the focal distance information on a taking lens with the signal acquired from the various sensors which are not illustrated or a system controller 23. The auto date section 27 sends photography time information to the code-conversion section 25.

[0011] The GPS section 28 sends the lat/long information as camera station information to the code-conversion section

25. The GPS section 28 numeric-data-izes the current position as a numeric value on lat/long as everyone knows based on the signal from at least three satellites. This GPS section 28 is the same as the thing and basic target which are employed as the navigation system for mount. When the navigation system using this GPS spread in recent years, integration of a circuit is progressing and the GPS section 28 can be carried in a camera on a scale of a very small circuit. And it is suitable for the accuracy of measurement to also have about 25m distinction capacity at all the points on the earth, and pinpoint a camera station also at this point.

[0012] The photography bearing elevation angle detecting element 29 is constituted by the well-known gyroscope device. This gyroscope device detects the sense (bearing) and elevation angle of a camera, and sends this to the code-conversion section as photography bearing elevation angle information in the case of photography.

[0013] Moreover, the number of photography pieces is sent to the code-conversion section 25 from a system controller 23. The code-conversion section 25 encodes various photography information for every photography piece by the predetermined code creation criteria memorized by memory 25a to build in, and sends this to the data write-in section 30. The data write-in section 30 sends the image pick-up data of each piece, and the coded data of photography information to floppy disk drive equipment 31. Floppy disk drive equipment 31 drives the magnetic-recording head to build in, and carries out magnetic recording of image pick-up data and the coded data of photography information to a floppy disk 10 in a predetermined format. In addition, when the photography information on each piece is memorized to memory 25a and all image pick-ups were completed, or when there is an input of a photography information write-in command instead of recording the coded data of photography information whenever it recorded the image pick-up data of each piece, you may make it write the coded data of photography information in a floppy disk 10.

[0014] Moreover, the playback section 33 is formed in the still video camera 11. The playback section 33 reproduces the image pick-up data written in a floppy disk 10, and the coded data of photography information, and as shown in drawing 3 , it outputs these to the color thermal printer 12, a personal computer, etc. through the external image output terminal 34, the external control output terminal 35, and the external photography information output terminal 36.

[0015] Next, how to create hard copy with the color thermal printer 12 is explained using the above-mentioned still video camera 11. As shown in drawing 3 , the external image input terminal 40 is formed in the color thermal printer 12, and this external image input terminal 40 and the external image output terminal 34 of a still video camera 11 are connected to it. Moreover, a control signal and photography information are inputted from a still video camera 11 through the output terminals 35 and 36 of a still video camera 11, and the input terminals 41 and 42 of the color thermal printer 12.

[0016] The NTSC signal sent out from the external image output terminal 34 is incorporated in the Y/C separation circuit 43 of the color thermal printer 12. The Y/C separation circuit 43 divides an NTSC signal into a luminance signal (Y) and a chrominance signal (C), and sends it to a decoder 44. A decoder 44 changes a luminance signal (Y) and a chrominance signal (C) into red (R), green (G), and a blue (B) three-primary-colors signal, and sends them to A/D converter 46 and a selector 47.

[0017] A selector 47 is usually set to a terminal (a) side by the playback mode, and is set to a terminal (b) side by the freeze mode. If a selector 47 is set to a terminal (a) side, image data will be sent out to the external image output terminal 49 through an encoder 48, and the still video image under playback to the color monitor 50 connected to this will be displayed. In a freeze mode, after the chrominance signal of each color is quantized with A/D converter 46, for example, being changed into a digital signal with 64 gradation, it is written in a frame memory 51. And this image data is sent to a color monitor 50 through the selector 47 set to the D/A-converter 52 and terminal (b) side. Said frame memory 51 consists of the three memory sections which memorize one image data of three colors at a time independently of each.

[0018] A controller 53 reads the image data of one classification by color from a frame memory 51 one by one among three colors at the time of the usual print, and sends this to the image-processing section 55. The image-processing section 55 performs each processing of color correction, concentration amendment, noise rejection, profile emphasis, etc., and writes the image data after this processing in the buffer memory 56 for a print.

[0019] In the image-processing section 55, hue amendment is performed using well-known matrix operation expression, and also color conversion to cyanogen (C), a Magenta (M), and yellow (Y) from R, G, and B is performed. The difference between the spectral characteristic of the color thermal recording ingredient 57 and the spectral sensitivity of a still video camera 11 is amended by this hue amendment. Moreover, in the image-processing section 55, gradation amendment of a gamma correction, contrast amendment, etc. is performed, and thereby, while the stimulus value of the photographic subject of an image pick-up system is changed into a concentration signal, the proper gradient according to the color thermal recording ingredient 57 is held. Moreover, the image-processing section 55 performs operations, such as the weighted mean for noise rejection, mean value filtering which is the noise rejection which does not obscure a boundary as everyone knows using a line type filtering circuit or a logic filtering circuit. Furthermore, based on well-known profile emphasis operation expression, the image data of the target pixel and the pixel in this perimeter also performs profile emphasis processing.

[0020] A controller 53 consists of a well-known microcomputer, and the keyboard 60 and the display 61 are connected. Thereby, setting out and the input in various modes can be performed now.

[0021] The photography information from a still video camera 11 is sent to a controller 53 through terminals 35 and 41. A controller 53 sends photography time information, lat/long information, and photography bearing elevation angle information to the name of a place retrieval section 65 among photography information. The name of a place retrieval section 65 pinpoints a camera station from lat/long information. Pinpointing of this camera station is performed using a related ****** positional information database in lat/long information and the name of a place. CD-ROM66 is memorized and provided with a positional information database. For this reason, CD-ROM drive equipment 67 is connected to the name of a place retrieval section 65. And the name of a place to which a point to this point uniquely pinpointed using lat/long information belongs is searched. The thing of lat/long information and the name of a place for which set to relate, and the address on administration is used, and also a prominent sightseeing spot, the building of a shrine Buddhist temple and others, etc. are searched from lat/long information (for example, "Karuizawa", "Tokyo Tower", etc.) is desirable. The searched name of a place data are sent to the image composition section 68 with the photography time information from a controller 53.

[0022] The image composition section 68 carries out bit map expansion of the alphabetic character image showing the name of a place and photography time, and writes this in the alphabetic data write-in area of a frame memory 50. Thereby, image composition of the image from a still video camera 11 and the alphabetic characters, such as camera station information, is carried out. This synthetic image can be checked by the color monitor 50.

[0023] The image data of one line from the buffer memory 56 for a print is written at a time in the line memory 70. The head actuator 71 drives a thermal head 72 based on the image data for one line from this line memory 71. As everyone knows, much heater element 72a is arranged in the shape of a line, and a thermal head 72 heats the color thermal recording ingredient 57, and performs sequential record 3 color plane. Drawing 4 shows an example of the hard copy 75 produced by doing in this way. The alphabetic character image 77 of photography time and the photography name of a place is recorded on this hard copy 75 with the image 76. Drawing 5 is a flow chart which shows the procedure in the color thermal printer 12.

[0024] As shown in drawing 6 , as for the color thermal recording ingredient 57, the cyanogen sensible-heat coloring layer 81, the Magenta sensible-heat coloring layer 82, the yellow sensible-heat coloring layer 83, and the protective layer 84 are ****(ed) one by one on the base material 80. As a base material 80, opaque coat paper or an opaque plastic film is used. The cyanogen sensible-heat coloring layer 81 contains an electron-donative color precursor and an electronic receptiveness compound as a principal component, and when heated, it colors them in cyanogen. As a Magenta sensible-heat coloring layer 82, the maximum absorption wavelength contains the diazonium salt compound which is about 365nm, and the coupler which carries out thermal reaction to this and colors to a Magenta. If this Magenta sensible-heat coloring layer 82 irradiates the ultraviolet rays near 365nm after heat record, a non-colored diazonium salt compound will photodissociate and coloring capacity will be lost. The yellow sensible-heat coloring layer 83 contains the diazonium salt compound whose maximum absorption wavelength is about 420nm, and the coupler which carries out thermal reaction to this and colors to yellow. If this yellow sensible-heat coloring layer 83 irradiates the ultraviolet rays near 420nm, optical fixation will be carried out and coloring capacity will be lost. In addition, the ultraviolet ray lamp for optical fixation has omitted the graphic display.

[0025] In addition, the photography name of a place is specified using the lat/long information on photography data, and also you may make it also specify the photographic subject theme automatically with procedure as shown in drawing 7 using the name of a place retrieval section 65 and the photographic subject theme specification section 88. In this case, the focal distance information on a taking lens and photography bearing elevation angle information other than lat/long information are used as photography data. And the specific area of a geography database is specified and the main photographic subjects which can be desired from this area, and a metaphor register the crest, the lake, etc. with that bearing elevation angle information. First, it is judged from lat/long information whether it is the photography location which can specify the photographic subject theme. In corresponding to a theme decision spot, it progresses to the following step, and it is judged whether the focal distance of a taking lens is in the predetermined range. For example, when the crest which serves as the photographic subject theme northward is registered into the theme decision spot and the focal distance of a taking lens is infinity, it progresses to the following step and it is judged for photography bearing and an elevation angle whether it is predetermined within the limits. And when photography bearing shows north, "the identifier of the crest, for example, "Mt. Fuji", the North Alps", etc. are determined as the photographic subject theme. Moreover, bit map expansion is carried out and the alphabetic character image which may combine with not only the photographic subject theme but a photography day and the photography name of a place, for example, expresses a sentence, such as "overlooking Asama-yama from North Karuizawa on August 20, Heisei 7", is written in a frame memory 51. Moreover, when it does not correspond to above-mentioned within the limits at each step, only the photography name of a place is determined. As photography bearing elevation angle information, north is set to "0", by displaying 360 degrees in order of the east, south, and the west, bearing is determined and the inclination information over the horizontal direction of a camera is further determined as an elevation angle, for example. Thus, since the photographic subject theme is specified using photography bearing and an elevation angle, a specific precision can be raised. In addition, specification of the photographic subject theme may specify only photography bearing information using the focal distance information and photography bearing information on a taking lens, although a specific precision other than photography bearing elevation angle information falls. Moreover, altitude information is recorded at the time of photography, and if altitude information is also collectively used in case the photographic subject theme specifies, a specific precision of the photographic subject theme can be raised further.

[0026] Thus, according to the image pick-up and image rendering system using a still video camera 11 and a video printer 12, the need of inputting a camera station, photography time, etc. each time, or checking them is lost, and it will become suitable as an object for a report as which a sex is required instancy. In this case, said photographic subject theme can be more exactly specified now because a cameraman operates a video printer. Moreover, in a video printer, composition of the alphabetic character which shows photography time and a location is easy compared with a photograph printer etc., and will become more effective.

[0027] Said geography database is making it use combining the database currently specially prepared not only in the address on the general name of a place or administration but in operation, and extensive utilization is attained. For example, the steel tower photograph taken to the maintenance is easily discriminable by using the database which registered the positional information of the high voltage steel tower which the electric power company has. Furthermore, by using photography bearing elevation angle information, altitude information, etc. for this, it can identify [the steel tower photograph from which direction it is also or], and operation, such as a maintenance, becomes easy more.

[0028] Although considered as the system which consists of combination of a still video camera 11 and the color thermal printer 12 in the above-mentioned example, you may carry out to the camera 91 using the photographic-film cartridge 90 equipped with the transparence magnetic-recording layer as shown in drawing 8 , and the photograph printer 92 as shown in drawing 9 . In this case, while the release switch 93 is operated by actuation of a release carbon button as shown in drawing 8 , and exposing a photographic subject image to the sensitive-emulsion side of a photographic film 97 using a taking lens 94, the shutter style 95, and an actuator 96, the magnetic-recording head 98 is used for the transparence magnetic-recording layer of a photographic film 97, and magnetic recording of the photography information is carried out. For this reason, a system controller 100 controls the auto date section 101, the GPS section 102, the photography bearing elevation angle detecting element 103, the photography data generating section 104, the code-conversion section 105, and the data write-in section 106, and carries out magnetic recording of photography time information, lat/long information, photography bearing elevation angle information, stroboscope luminescence information, the focal distance information on a taking lens, the photographic subject brightness information, etc. to a transparence magnetic-recording layer as photography information.

[0029] As shown in drawing 9 , by the photograph printer 92, the coma for a print of the photographic film 97 set to the tape carrier package 110 is illuminated as everyone knows by the light source section 111 by which light quality adjustment was carried out, and printing exposure of the image of the coma for a print of this illuminated photographic film 97 is carried out with the printing lens 112 at a color paper 113. The light source section 111 consists of a lamp 114, a filter actuator 119 which inserts the 3 color filter 115,116,117 in the printing optical path 118, and does light quality adjustment, and a diffusion box 120. Moreover, the scanner 121 is arranged as everyone knows in the location which faces a coma for a print, and 3 ******s of this scanner 121 measure the strength of the light in each point of a coma for a print. This photometry value is sent to the weighted-solidity calculation section 122. The weighted-solidity calculation section 122 extracts various weighted solidity, and also carries out the scene classification of the coma for a print as everyone knows, and computes the amount of exposure amendments based on this scene classification result. The light exposure operation part 123 by which weighted solidity and the amount of exposure amendments are sent to the light exposure operation part 123 computes the printing light exposure which used well-known light exposure operation expression, and sends this to a controller 125. A controller 125 computes the insertion point to the printing optical path 118 of color filters 115-117 based on this printing light exposure, and sends this to the filter actuator 119. The filter actuator 119 inserts each color filters 115-117 in a filter insertion point, and adjusts the light quality of printing light. After carrying out light quality accommodation, the shutter actuator 126 opens a shutter 127 fixed time, and does printing exposure of the image of a coma for a print at a color paper 113.

[0030] The magnetic read head 130 is formed in the tape carrier package 110, and the photography information recorded on the transparence magnetic-recording layer is read. A decoder 131 changes photography information into an available data format by the photograph printer 92, and sends this to a controller 125. CD-ROM drive equipment 132 is set to the controller 125, the geography database memorized by CD-ROM133 is searched for it, and the photographic subject theme is specified as it a camera station and if needed. Pinpointing of this camera station etc. is performed by operating the keyboard 128 and display 129 which were connected to the controller 125, and the camera station and photography time which were specified are sent to the alphabetic character baking controller 134. By synchronizing the alphabetic character glow lump head 135 with delivery of a color paper 113, and driving it, the alphabetic character baking controller 134 carries out line exposure of the alphabetic characters, such as a camera station, at a color paper 113, and burns an alphabetic character. Moreover, exposure amendment data, a coma number, etc. are sent to the flesh-side printing controller 136. The flesh-side printing controller 136 drives the flesh-side print head 137, and prints a coma number and exposure amendment data at the rear face of a color paper 113 as everyone knows. After a constant-rate reservoir is carried out with the paper reservoir 140, by the paper processor 141, the development of the color paper 113 with which printing exposure of the image of a photographic film 97 is carried out, and the photography name of a place etc. was burned is carried out, and it is cut for every coma. The print photograph with which a camera station and photography time were burned like the hard copy which this shows to drawing 4 is produced.

[0031] In addition, a camera station is burned, and also using the flesh-side print head 137, as shown in drawing 10 , the alphabetic characters 143, such as a camera station, and the photography theme, photography time, may be printed with the coma number 141 and the exposure amendment data 142 at the rear face 140 of a print photograph. Moreover, in the above-mentioned example, although photography information was recorded on the transparence magnetic-recording layer of a photographic film 97, it may replace with this and photography information may be recorded on the LSI memory and the LSI card which were prepared with a cartridge 90, one, or another object. Moreover, lat/long information may be bar-code-ized and may be optically recorded on a corresponding piece.

[0032] Moreover, although the color thermal printer 12 was used as a video printer, the video printer of various recording methods, such as a recording method of the thermofusion mold using an ink ribbon or a heat sublimation mold, and an ink jet method, a laser-beam method, can be used. Moreover, you may make it record image data and photography information on an LSI card etc. electronically in a still video camera 11 instead of carrying out magnetic recording to a floppy disk 10.

[0033] Furthermore, you may carry out to the video camera which memorizes the dynamic image and voice other than a still video camera which record a static image. In this case, it is good to add retrieval functions, such as the name of a place, to a videocassette recorder, to carry out image composition of the photography name of a place, the photography time, etc., and to display on a monitor. Moreover, it synthesizes voice from the photography name of a place and time other than image composition of an alphabetic character, and you may make it record this on a corresponding image. Moreover, what was constituted so that digital image data might be outputted is sufficient as a still video camera, and image data is recorded in this case using a well-known picture compression method. Moreover, what was included in the video printer is used, and also pinpointing of a camera station may be performed using a personal computer etc.

[0034] moreover -- backlight photography of as opposed to [in the system using a photographic film, pinpoint the location of the sun at the time of photography from photography time information, camera station information, and photography bearing information, and] the sunlight from this solar position information and photography brightness information ****** -- etc. -- it may be made to perform concentration of the image judged and photoed, and color balance amendment. Moreover, in the above-mentioned example, as camera station information, although lat/long information was used, the polar-coordinate data of a three dimension etc. may be used that what is necessary is just what can pinpoint a photography location uniquely.

[0035]

[Effect of the Invention] According to this invention, since the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal is searched for and this camera station information was written in the record medium, based on camera station information, the name of a place etc. cannot be specified by the photography equipment side, and the configuration by the side of a camera can be simplified. And the camera station information which can pinpoint a camera station uniquely is written in the record medium, and data processing can be performed now by the image rendering equipment side based on camera station information. Therefore, it is not necessary to suppress the amount of information of a geography database few, and specification of the accurate photography name of a place is attained.

[0036] Moreover, specification of the photographic subject theme etc. is attained other than the specification of the mere photography name of a place as photography information by using the photography bearing information and the focal distance information on a taking lens other than camera station information. Moreover, by using the geography database which inputted location data, such as a specific building, specification of the copied building, its photography sense, etc. can be easily known from camera station information and photography bearing information, and in case it is photography, it is not necessary to fill in a memorandum etc. and becomes convenient. Furthermore, a specific precision of the photographic subject theme can be raised now by adding the photography elevation angle information other than photography bearing information.

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TECHNICAL FIELD

[Field of the Invention] In case this invention records the camera station information which pinpoints a camera station uniquely, bearing information, bearing elevation angle information at the time of photography, etc. and reproduces an image with photography, it relates to the photography equipment and image rendering equipment which displayed or recorded the photography name of a place, the photographic subject theme, etc. with the rendering image.

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PRIOR ART

[Description of the Prior Art] The approach of carrying out a photoprint to a photographic film using the camera and this which recorded photography information, such as light source information, Japan-China synchro information, and photography intention information, in the case of photography etc. is proposed (for example, Japanese-Patent-Application-No. No. 113347 [four to] official report). Moreover, it has the global positioning system (GPS) function to judge the current position based on the signal from a satellite, and in case a photograph is taken, time, the location, and the camera with built-in GPS recorded together are proposed (for example, JP,7-64169,A).
[0003] By using the camera which records the various above-mentioned photography information, the high quality print which various photography information was utilized [print] and fully demonstrated the function of a camera and the engine performance of sensitive material comes to be obtained. Moreover, with the above-mentioned camera with built-in GPS, it is recorded in case the exact photography name of a place is photography, and the print photograph with which the photography name of a place was compounded on the occasion of a photoprint comes to be acquired.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, since the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal is searched for and this camera station information was written in the record medium, based on camera station information, the name of a place etc. cannot be specified by the photography equipment side, and the configuration by the side of a camera can be simplified. And the camera station information which can pinpoint a camera station uniquely is written in the record medium, and data processing can be performed now by the image rendering equipment side based on camera station information. Therefore, it is not necessary to suppress the amount of information of a geography database few, and specification of the accurate photography name of a place is attained.
[0036] Moreover, specification of the photographic subject theme etc. is attained other than the specification of the mere photography name of a place as photography information by using the photography bearing information and the focal distance information on a taking lens other than camera station information. Moreover, by using the geography database which inputted location data, such as a specific building, specification of the copied building, its photography sense, etc. can be easily known from camera station information and photography bearing information, and in case it is photography, it is not necessary to fill in a memorandum etc. and becomes convenient. Furthermore, a specific precision of the photographic subject theme can be raised now by adding the photography elevation angle information other than photography bearing information.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The photography name of a place beforehand registered based on the lat/long information acquired from the GPS function is searched with the above-mentioned camera with built-in GPS from a geography database, and the corresponding photography name of a place is displayed on the display of a camera. And when this content is sufficient, information, such as the photography name of a place and photography time, will be recorded by operating a predetermined switch. Therefore, it is necessary to memorize a vast quantity of geography databases which related lat/long information and the photography name of a place corresponding to this with the camera side, and the storage capacity to need will become huge. For this reason, there is a problem that mass storage is needed. Moreover, with the above-mentioned camera with built-in GPS, since the photography name of a place is memorized, there is a problem that it cannot use effective in assistance of exposure control of camera station data, specification of the photographic subject theme, etc.
[0005] This invention aims at offering the photography equipment and image rendering equipment which enabled it to pinpoint the photographic subject theme, the location of the sunlight in the case of photography, etc. by displaying a photography location etc. on the photoed screen together moreover based on a GPS function, without using mass storage capacity, and also using combining a photography location, bearing of the exposure axis, the photography information on other, etc.

[Translation done.]

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, the photography equipment indicated to claim 1 is equipped with a means to detect the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal, and the means which writes this camera station information in a record medium. Moreover, photography equipment according to claim 2 is equipped with the means which writes a means to detect the photography bearing information that photography bearing in the case of photography is pinpointed in a thing according to claim 1, and this photography bearing information and the focal distance information on a taking lens in a record medium with camera station information. Moreover, image rendering equipment according to claim 3 also writes in photography elevation angle information with photography bearing information. Moreover, image rendering equipment according to claim 4 is equipped with a means to determine the photography name of a place from camera station information, and a means to record or display the photography name of a place searched for with a rendering image. Moreover, image rendering equipment according to claim 5 is equipped with a means to determine the photography name of a place from camera station information, a means to specify the photographic subject theme from the focal distance information on a taking lens, and the bearing information at the time of photography, and a means to record or display both the photography name of a places and the photographic subject themes which were searched for with a rendering image. [both / one side or] Moreover, in case image rendering equipment according to claim 6 specifies the photographic subject theme, the photography elevation angle information other than bearing information is used for it.
[0007] In the case of photography, with a still video camera, a photographic subject image is picturized by release actuation by the image area sensor, and this image data is written in the record medium of memory, such as for example, an LSI card, or a floppy disk. Moreover, besides the writing of this image data, with other photography time information, the focal distance information on a taking lens, photography bearing information, etc., the camera station information which pinpoints uniquely the camera station in the case of photography by the GPS function, for example, lat/long information, makes it correspond to a photography coma, and it is recorded on a record medium. When reproducing the photoed image, in the case of a still video camera, the lat/long information on a coma for a print, photography time information, the focal distance information on a taking lens, photography bearing elevation angle information, etc. are read first. And the photography name of a place is specified based on lat/long information. Next, "Mt. Fuji", the "North Alps", etc. are pinpointed, for example as the theme of scenery from photography bearing elevation angle information and the focal distance information on a taking lens. These photography name of a place, the photographic subject theme, etc. are displayed on a display with image data. And the photoed color picture is printed for example, on a color thermal recording ingredient by entering the photography name of a place using video printers, such as a color thermal printer, if needed. In this case, the photography address pinpointed based on lat/long information besides the name of a place may be recorded. Moreover, lat/long information etc. may be recorded with a 8mm video camera. The specification becomes easy, when a photography person performs edit and production of hard copy and it specifies the photographic subject theme especially from the camera station information by the GPS function, and photography bearing information in the case of a still video camera or a 8mm video camera.
[0008]
[Embodiment of the Invention] Drawing 1 is the functional block diagram showing the image rendering system which consists of a color thermal printer 12 which prints an image with the photography name of a place using the still video camera 11 which recorded various photography information with image data, and the data picturized with this still

video camera 11 using a floppy disk 10. As everyone knows, the photography section 20 of a still video camera 11 consists of image pick-up optical system and a color image area sensor, by actuation of the release switch 21, picturizes a photographic subject and memorizes this to an image memory 22. Moreover, a focus is performed by the autofocus device on the occasion of photography.

[0009] Sequence control of the image pick-up section 20 and the image memory 22 is carried out by the system controller 23. The system controller 23 records various photography data on the magnetic-recording layer of a floppy disk 10 with image pick-up data while it consists of well-known microcomputers and picturizes by carrying out sequence control of each part by actuation of the release switch 21. The flow chart of the procedure in a system controller 23 is shown in drawing 2 .

[0010] The photography data generating section 26, the auto date section 27, the GPS section 28, and the photography bearing elevation angle detecting element 29 are connected to the code-conversion section 25, and various photography information is inputted into it by these. The photography data generating section 26 generates light source kind information, stroboscope luminescence information, and the focal distance information on a taking lens with the signal acquired from the various sensors which are not illustrated or a system controller 23. The auto date section 27 sends photography time information to the code-conversion section 25.

[0011] The GPS section 28 sends the lat/long information as camera station information to the code-conversion section 25. The GPS section 28 numeric-data-izes the current position as a numeric value on lat/long as everyone knows based on the signal from at least three satellites. This GPS section 28 is the same as the thing and basic target which are employed as the navigation system for mount. When the navigation system using this GPS spread in recent years, integration of a circuit is progressing and the GPS section 28 can be carried in a camera on a scale of a very small circuit. And it is suitable for the accuracy of measurement to also have about 25m distinction capacity at all the points on the earth, and pinpoint a camera station also at this point.

[0012] The photography bearing elevation angle detecting element 29 is constituted by the well-known gyroscope device. This gyroscope device detects the sense (bearing) and elevation angle of a camera, and sends this to the code-conversion section as photography bearing elevation angle information in the case of photography.

[0013] Moreover, the number of photography pieces is sent to the code-conversion section 25 from a system controller 23. The code-conversion section 25 encodes various photography information for every photography piece by the predetermined code creation criteria memorized by memory 25a to build in, and sends this to the data write-in section 30. The data write-in section 30 sends the image pick-up data of each piece, and the coded data of photography information to floppy disk drive equipment 31. Floppy disk drive equipment 31 drives the magnetic-recording head to build in, and carries out magnetic recording of image pick-up data and the coded data of photography information to a floppy disk 10 in a predetermined format. In addition, when the photography information on each piece is memorized to memory 25a and all image pick-ups were completed, or when there is an input of a photography information write-in command instead of recording the coded data of photography information whenever it recorded the image pick-up data of each piece, you may make it write the coded data of photography information in a floppy disk 10.

[0014] Moreover, the playback section 33 is formed in the still video camera 11. The playback section 33 reproduces the image pick-up data written in a floppy disk 10, and the coded data of photography information, and as shown in drawing 3 , it outputs these to the color thermal printer 12, a personal computer, etc. through the external image output terminal 34, the external control output terminal 35, and the external photography information output terminal 36.

[0015] Next, how to create hard copy with the color thermal printer 12 is explained using the above-mentioned still video camera 11. As shown in drawing 3 , the external image input terminal 40 is formed in the color thermal printer 12, and this external image input terminal 40 and the external image output terminal 34 of a still video camera 11 are connected to it. Moreover, a control signal and photography information are inputted from a still video camera 11 through the output terminals 35 and 36 of a still video camera 11, and the input terminals 41 and 42 of the color thermal printer 12.

[0016] The NTSC signal sent out from the external image output terminal 34 is incorporated in the Y/C separation circuit 43 of the color thermal printer 12. The Y/C separation circuit 43 divides an NTSC signal into a luminance signal (Y) and a chrominance signal (C), and sends it to a decoder 44. A decoder 44 changes a luminance signal (Y) and a chrominance signal (C) into red (R), green (G), and a blue (B) three-primary-colors signal, and sends them to A/D converter 46 and a selector 47.

[0017] A selector 47 is usually set to a terminal (a) side by the playback mode, and is set to a terminal (b) side by the freeze mode. If a selector 47 is set to a terminal (a) side, image data will be sent out to the external image output terminal 49 through an encoder 48, and the still video image under playback to the color monitor 50 connected to this will be displayed. In a freeze mode, after the chrominance signal of each color is quantized with A/D converter 46, for example, being changed into a digital signal with 64 gradation, it is written in a frame memory 51. And this image data is sent to a color monitor 50 through the selector 47 set to the D/A-converter 52 and terminal (b) side. Said frame memory 51 consists of the three memory sections which memorize one image data of three colors at a time independently of each.

[0018] A controller 53 reads the image data of one classification by color from a frame memory 51 one by one among three colors at the time of the usual print, and sends this to the image-processing section 55. The image-processing section 55 performs each processing of color correction, concentration amendment, noise rejection, profile emphasis, etc., and writes the image data after this processing in the buffer memory 56 for a print.

[0019] In the image-processing section 55, hue amendment is performed using well-known matrix operation expression, and also color conversion to cyanogen (C), a Magenta (M), and yellow (Y) from R, G, and B is performed. The difference between the spectral characteristic of the color thermal recording ingredient 57 and the spectral sensitivity of a still video camera 11 is amended by this hue amendment. Moreover, in the image-processing section 55, gradation amendment of a gamma correction, contrast amendment, etc. is performed, and thereby, while the stimulus value of the photographic subject of an image pick-up system is changed into a concentration signal, the proper gradient according to the color thermal recording ingredient 57 is held. Moreover, the image-processing section 55 performs operations, such as the weighted mean for noise rejection, mean value filtering which is the noise rejection which does not obscure a boundary as everyone knows using a line type filtering circuit or a logic filtering circuit. Furthermore, based on well-known profile emphasis operation expression, the image data of the target pixel and the pixel in this perimeter also performs profile emphasis processing.

[0020] A controller 53 consists of a well-known microcomputer, and the keyboard 60 and the display 61 are connected. Thereby, setting out and the input in various modes can be performed now.

[0021] The photography information from a still video camera 11 is sent to a controller 53 through terminals 35 and 41. A controller 53 sends photography time information, lat/long information, and photography bearing elevation angle information to the name of a place retrieval section 65 among photography information. The name of a place retrieval section 65 pinpoints a camera station from lat/long information. Pinpointing of this camera station is performed using a related ****** positional information database in lat/long information and the name of a place. CD-ROM66 is memorized and provided with a positional information database. For this reason, CD-ROM drive equipment 67 is connected to the name of a place retrieval section 65. And the name of a place to which a point to this point uniquely pinpointed using lat/long information belongs is searched. The thing of lat/long information and the name of a place for which set to relate, and the address on administration is used, and also a prominent sightseeing spot, the building of a shrine Buddhist temple and others, etc. are searched from lat/long information (for example, "Karuizawa", "Tokyo Tower", etc.) is desirable. The searched name of a place data are sent to the image composition section 68 with the photography time information from a controller 53.

[0022] The image composition section 68 carries out bit map expansion of the alphabetic character image showing the name of a place and photography time, and writes this in the alphabetic data write-in area of a frame memory 50. Thereby, image composition of the image from a still video camera 11 and the alphabetic characters, such as camera station information, is carried out. This synthetic image can be checked by the color monitor 50.

[0023] The image data of one line from the buffer memory 56 for a print is written at a time in the line memory 70. The head actuator 71 drives a thermal head 72 based on the image data for one line from this line memory 71. As everyone knows, much heater element 72a is arranged in the shape of a line, and a thermal head 72 heats the color thermal recording ingredient 57, and performs sequential record 3 color plane. Drawing 4 shows an example of the hard copy 75 produced by doing in this way. The alphabetic character image 77 of photography time and the photography name of a place is recorded on this hard copy 75 with the image 76. Drawing 5 is a flow chart which shows the procedure in the color thermal printer 12.

[0024] As shown in drawing 6 , as for the color thermal recording ingredient 57, the cyanogen sensible-heat coloring layer 81, the Magenta sensible-heat coloring layer 82, the yellow sensible-heat coloring layer 83, and the protective layer 84 are ****(ed) one by one on the base material 80. As a base material 80, opaque coat paper or an opaque plastic film is used. The cyanogen sensible-heat coloring layer 81 contains an electron-donative color precursor and an

.electronic receptiveness compound as a principal component, and when heated, it colors them in cyanogen. As a Magenta sensible-heat coloring layer 82, the maximum absorption wavelength contains the diazonium salt compound which is about 365nm, and the coupler which carries out thermal reaction to this and colors to a Magenta. If this Magenta sensible-heat coloring layer 82 irradiates the ultraviolet rays near 365nm after heat record, a non-colored diazonium salt compound will photodissociate and coloring capacity will be lost. The yellow sensible-heat coloring layer 83 contains the diazonium salt compound whose maximum absorption wavelength is about 420nm, and the coupler which carries out thermal reaction to this and colors to yellow. If this yellow sensible-heat coloring layer 83 irradiates the ultraviolet rays near 420nm, optical fixation will be carried out and coloring capacity will be lost. In addition, the ultraviolet ray lamp for optical fixation has omitted the graphic display.
[0025] In addition, the photography name of a place is specified using the lat/long information on photography data, and also you may make it also specify the photographic subject theme automatically with procedure as shown in drawing 7 using the name of a place retrieval section 65 and the photographic subject theme specification section 88. In this case, the focal distance information on a taking lens and photography bearing elevation angle information other than lat/long information are used as photography data. And the specific area of a geography database is specified and the main photographic subjects which can be desired from this area, and a metaphor register the crest, the lake, etc. with that bearing elevation angle information. First, it is judged from lat/long information whether it is the photography location which can specify the photographic subject theme. In corresponding to a theme decision spot, it progresses to the following step, and it is judged whether the focal distance of a taking lens is in the predetermined range. For example, when the crest which serves as the photographic subject theme northward is registered into the theme decision spot and the focal distance of a taking lens is infinity, it progresses to the following step and it is judged for photography bearing and an elevation angle whether it is predetermined within the limits. And when photography bearing shows north, "the identifier of the crest, for example, "Mt. Fuji", the North Alps", etc. are determined as the photographic subject theme. Moreover, bit map expansion is carried out and the alphabetic character image which may combine with not only the photographic subject theme but a photography day and the photography name of a place, for example, expresses a sentence, such as "overlooking Asama-yama from North Karuizawa on August 20, Heisei 7", is written in a frame memory 51. Moreover, when it does not correspond to above-mentioned within the limits at each step, only the photography name of a place is determined. As photography bearing elevation angle information, north is set to "0", by displaying 360 degrees in order of the east, south, and the west, bearing is determined and the inclination information over the horizontal direction of a camera is further determined as an elevation angle, for example. Thus, since the photographic subject theme is specified using photography bearing and an elevation angle, a specific precision can be raised. In addition, specification of the photographic subject theme may specify only photography bearing information using the focal distance information and photography bearing information on a taking lens, although a specific precision other than photography bearing elevation angle information falls. Moreover, altitude information is recorded at the time of photography, and if altitude information is also collectively used in case the photographic subject theme specifies, a specific precision of the photographic subject theme can be raised further.
[0026] Thus, according to the image pick-up and image rendering system using a still video camera 11 and a video printer 12, the need of inputting a camera station, photography time, etc. each time, or checking them is lost, and it will become suitable as an object for a report as which a sex is required instancy. In this case, said photographic subject theme can be more exactly specified now because a cameraman operates a video printer. Moreover, in a video printer, composition of the alphabetic character which shows photography time and a location is easy compared with a photograph printer etc., and will become more effective.
[0027] Said geography database is making it use combining the database currently specially prepared not only in the address on the general name of a place or administration but in operation, and extensive utilization is attained. For example, the steel tower photograph taken to the maintenance is easily discriminable by using the database which registered the positional information of the high voltage steel tower which the electric power company has. Furthermore, by using photography bearing elevation angle information, altitude information, etc. for this, it can identify [the steel tower photograph from which direction it is also or], and operation, such as a maintenance, becomes easy more.
[0028] Although considered as the system which consists of combination of a still video camera 11 and the color thermal printer 12 in the above-mentioned example, you may carry out to the camera 91 using the photographic-film cartridge 90 equipped with the transparence magnetic-recording layer as shown in drawing 8 , and the photograph

printer 92 as shown in drawing 9 . In this case, while the release switch 93 is operated by actuation of a release carbon button as shown in drawing 8 , and exposing a photographic subject image to the sensitive-emulsion side of a photographic film 97 using a taking lens 94, the shutter style 95, and an actuator 96, the magnetic-recording head 98 is used for the transparence magnetic-recording layer of a photographic film 97, and magnetic recording of the photography information is carried out. For this reason, a system controller 100 controls the auto date section 101, the GPS section 102, the photography bearing elevation angle detecting element 103, the photography data generating section 104, the code-conversion section 105, and the data write-in section 106, and carries out magnetic recording of photography time information, lat/long information, photography bearing elevation angle information, stroboscope luminescence information, the focal distance information on a taking lens, the photographic subject brightness information, etc. to a transparence magnetic-recording layer as photography information.

[0029] As shown in drawing 9 , by the photograph printer 92, the coma for a print of the photographic film 97 set to the tape carrier package 110 is illuminated as everyone knows by the light source section 111 by which light quality adjustment was carried out, and printing exposure of the image of the coma for a print of this illuminated photographic film 97 is carried out with the printing lens 112 at a color paper 113. The light source section 111 consists of a lamp 114, a filter actuator 119 which inserts the 3 color filter 115,116,117 in the printing optical path 118, and does light quality adjustment, and a diffusion box 120. Moreover, the scanner 121 is arranged as everyone knows in the location which faces a coma for a print, and 3 ******s of this scanner 121 measure the strength of the light in each point of a coma for a print. This photometry value is sent to the weighted-solidity calculation section 122. The weighted-solidity calculation section 122 extracts various weighted solidity, and also carries out the scene classification of the coma for a print as everyone knows, and computes the amount of exposure amendments based on this scene classification result. The light exposure operation part 123 by which weighted solidity and the amount of exposure amendments are sent to the light exposure operation part 123 computes the printing light exposure which used well-known light exposure operation expression, and sends this to a controller 125. A controller 125 computes the insertion point to the printing optical path 118 of color filters 115-117 based on this printing light exposure, and sends this to the filter actuator 119. The filter actuator 119 inserts each color filters 115-117 in a filter insertion point, and adjusts the light quality of printing light. After carrying out light quality accommodation, the shutter actuator 126 opens a shutter 127 fixed time, and does printing exposure of the image of a coma for a print at a color paper 113.

[0030] The magnetic read head 130 is formed in the tape carrier package 110, and the photography information recorded on the transparence magnetic-recording layer is read. A decoder 131 changes photography information into an available data format by the photograph printer 92, and sends this to a controller 125. CD-ROM drive equipment 132 is set to the controller 125, the geography database memorized by CD-ROM133 is searched for it, and the photographic subject theme is specified as it a camera station and if needed. Pinpointing of this camera station etc. is performed by operating the keyboard 128 and display 129 which were connected to the controller 125, and the camera station and photography time which were specified are sent to the alphabetic character baking controller 134. By synchronizing the alphabetic character glow lump head 135 with delivery of a color paper 113, and driving it, the alphabetic character baking controller 134 carries out line exposure of the alphabetic characters, such as a camera station, at a color paper 113, and burns an alphabetic character. Moreover, exposure amendment data, a coma number, etc. are sent to the flesh-side printing controller 136. The flesh-side printing controller 136 drives the flesh-side print head 137, and prints a coma number and exposure amendment data at the rear face of a color paper 113 as everyone knows. After a constant-rate reservoir is carried out with the paper reservoir 140, by the paper processor 141, the development of the color paper 113 with which printing exposure of the image of a photographic film 97 is carried out, and the photography name of a place etc. was burned is carried out, and it is cut for every coma. The print photograph with which a camera station and photography time were burned like the hard copy which this shows to drawing 4 is produced.

[0031] In addition, a camera station is burned, and also using the flesh-side print head 137, as shown in drawing 10 , the alphabetic characters 143, such as a camera station, and the photography theme, photography time, may be printed with the coma number 141 and the exposure amendment data 142 at the rear face 140 of a print photograph. Moreover, in the above-mentioned example, although photography information was recorded on the transparence magnetic-recording layer of a photographic film 97, it may replace with this and photography information may be recorded on the LSI memory and the LSI card which were prepared with a cartridge 90, one, or another object. Moreover, lat/long information may be bar-code-ized and may be optically recorded on a corresponding piece.

[0032] Moreover, although the color thermal printer 12 was used as a video printer, the video printer of various recording methods, such as a recording method of the thermofusion mold using an ink ribbon or a heat sublimation mold, and an ink jet method, a laser-beam method, can be used. Moreover, you may make it record image data and photography information on an LSI card etc. electronically in a still video camera 11 instead of carrying out magnetic recording to a floppy disk 10.

[0033] Furthermore, you may carry out to the video camera which memorizes the dynamic image and voice other than a still video camera which record a static image. In this case, it is good to add retrieval functions, such as the name of a place, to a videocassette recorder, to carry out image composition of the photography name of a place, the photography time, etc., and to display on a monitor. Moreover, it synthesizes voice from the photography name of a place and time other than image composition of an alphabetic character, and you may make it record this on a corresponding image. Moreover, what was constituted so that digital image data might be outputted is sufficient as a still video camera, and image data is recorded in this case using a well-known picture compression method. Moreover, what was included in the video printer is used, and also pinpointing of a camera station may be performed using a personal computer etc.

[0034] moreover -- backlight photography of as opposed to [in the system using a photographic film, pinpoint the location of the sun at the time of photography from photography time information, camera station information, and photography bearing information, and] the sunlight from this solar position information and photography brightness information ****** -- etc. -- it may be made to perform concentration of the image judged and photoed, and color balance amendment. Moreover, in the above-mentioned example, as camera station information, although lat/long information was used, the polar-coordinate data of a three dimension etc. may be used that what is necessary is just what can pinpoint a photography location uniquely.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the schematic diagram showing the still video camera which carried out this invention.
[Drawing 2] It is the flow chart which shows the procedure in this still video camera.
[Drawing 3] It is the functional block diagram showing the color thermal printer which carried out this invention.
[Drawing 4] It is the front view showing an example of hard copy.
[Drawing 5] It is the flow chart which shows the procedure of a color thermal printer.
[Drawing 6] It is the schematic diagram showing the layer system of a color thermal recording ingredient.
[Drawing 7] It is the flow chart which shows the procedure which specifies the photographic subject theme.
[Drawing 8] It is the schematic diagram showing the camera which records lat/long information.
[Drawing 9] It is the schematic diagram showing the printer processor which burns a camera station.
[Drawing 10] It is the top view showing an example of printing to the rear face of the print photograph acquired by this printer processor.
[Description of Notations]
10 Floppy Disk
11 Still Video Camera
12 Color Thermal Printer
20 Image Pick-up Section
28 The GPS Section
29 Photography Bearing Elevation Angle Detecting Element
30 Data Write-in Section
31 Floppy Disk Drive Equipment
33 Playback Section
50 Color Monitor
57 Color Thermal Recording Ingredient
67,132 CD-ROM drive equipment
68,133 CD-ROM
72 Thermal Head
75 Hard Copy
76 Image
77 Alphabetic Character Image

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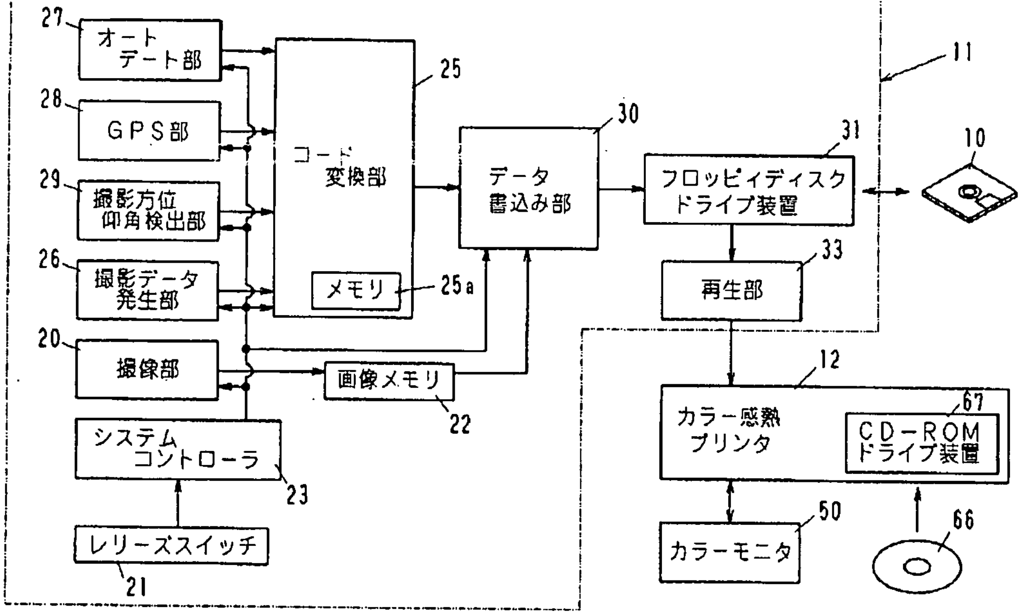
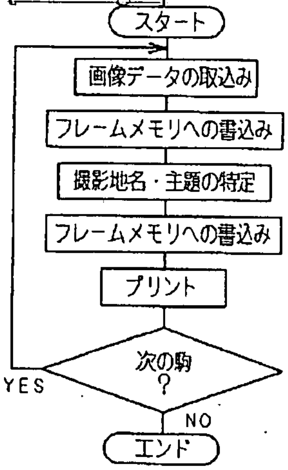
DRAWINGS

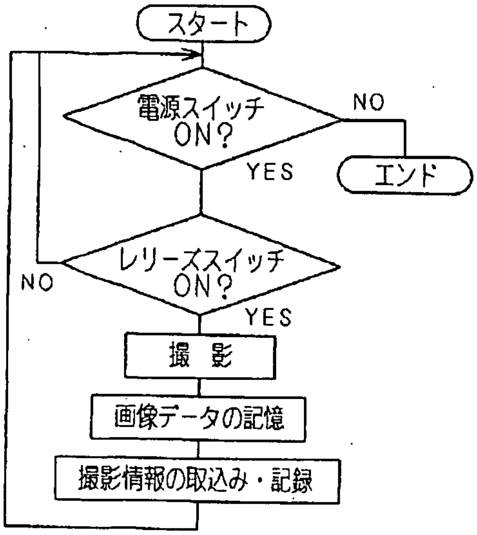
[Drawing 1]


27
オート
デート部
28
GPS部
29
撮影方位
仰角検出部
26
撮影データ
発生部
20
撮像部
システム
コントローラ
23
レリーズスイッチ
21
コード
変換部
25
メモリ
25a
画像メモリ
22
データ
書込み部
30
フロッピィディスク
ドライブ装置
31
11
10
再生部
33
12
カラー感熱
プリンタ
67
CD−ROM
ドライブ装置
50
カラーモニタ
66

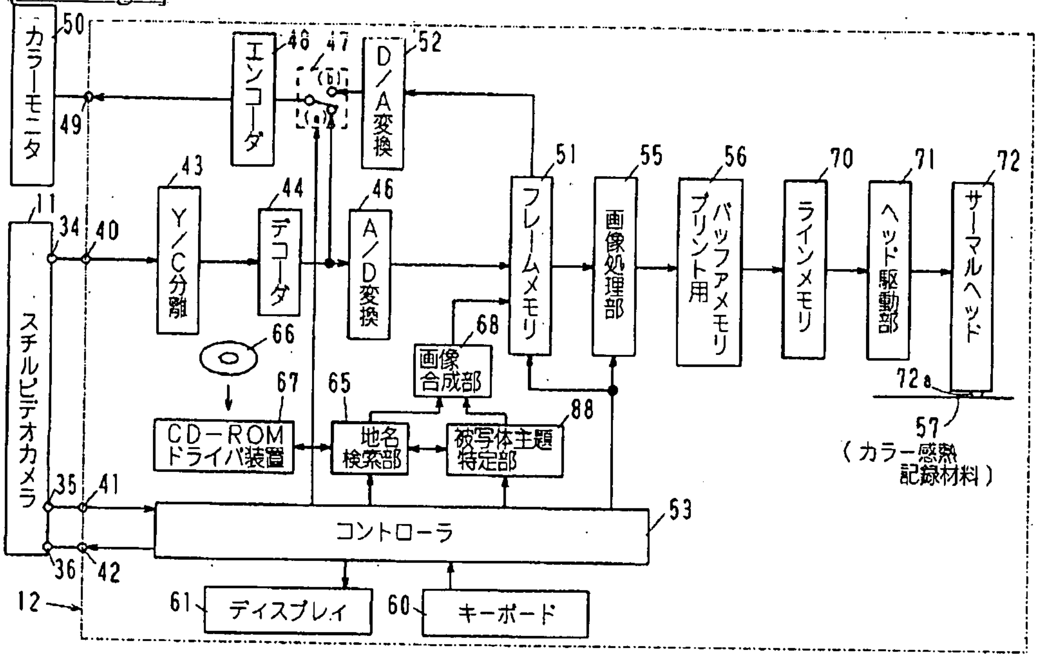
[Drawing 5]


スタート
画像データの取込み
フレームメモリへの書込み
撮影地名・主題の特定
フレームメモリへの書込み
プリント
次の駒
？
YES
NO
エンド

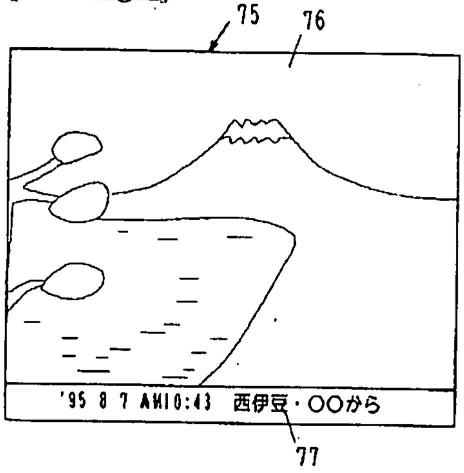
[Drawing 2]


スタート
電源スイッチ ON?
NO
YES
エンド
レリーズスイッチ ON?
NO
YES
撮 影
画像データの記憶
撮影情報の取込み・記録

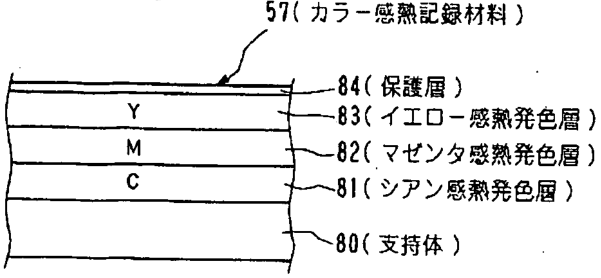
[Drawing 3]


カラーモニタ
50
49
エンコーダ
46
47
(b)
(a)
D/A変換
52
43
Y/C分離
44
デコーダ
46
A/D変換
51
フレームメモリ
55
画像処理部
56
バッファメモリ プリント用
70
ラインメモリ
71
ヘッド駆動部
72
サーマルヘッド
72a
57
（カラー感熱記録材料）
11
34
40
スチルビデオカメラ
66
67
CD－ROM ドライバ装置
65
地名検索部
68
画像合成部
88
被写体主題特定部
35
41
36
42
コントローラ
53
12
61
ディスプレイ
60
キーボード

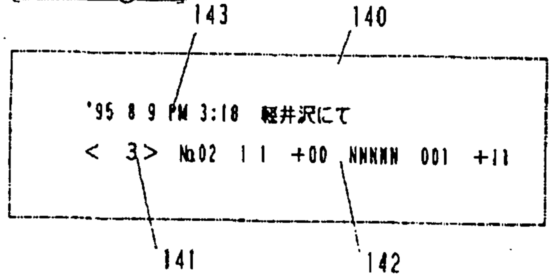
[Drawing 4]


75
76
'95 8 7 AM10:43 西伊豆・OOから
77

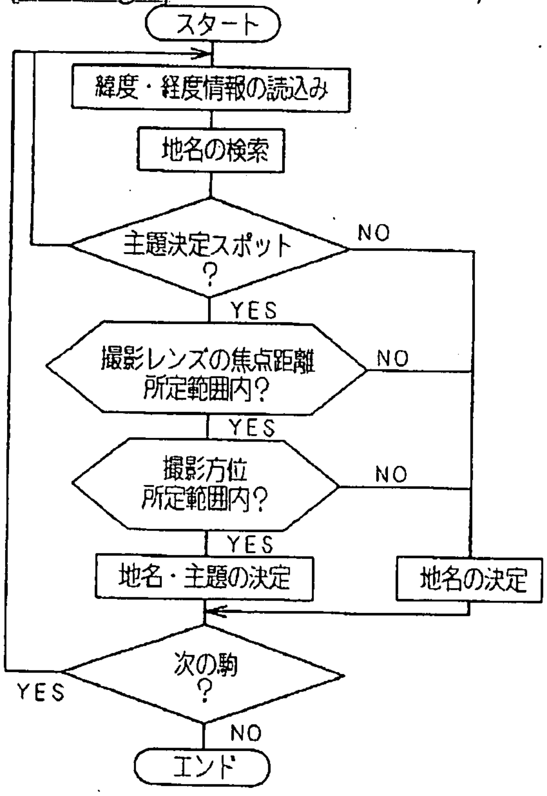
[Drawing 6]


57（カラー感熱記録材料）
84（保護層）
Y
83（イエロー感熱発色層）
M
82（マゼンタ感熱発色層）
C
81（シアン感熱発色層）
80（支持体）

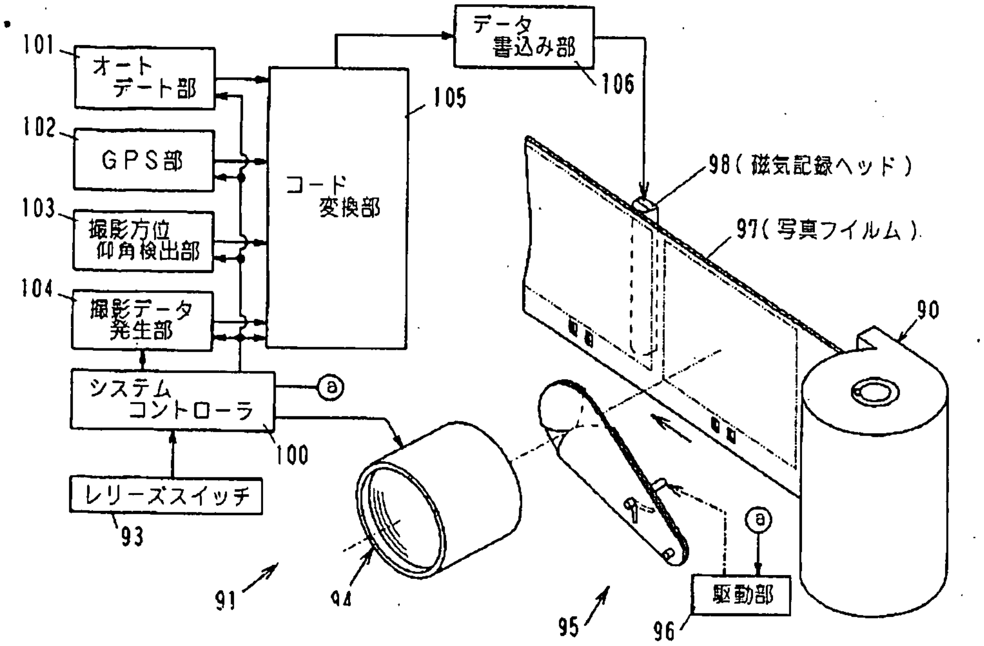
[Drawing 10]


143
140
'95 8 9 PM 3:18 軽井沢にて
< 3> No02 1 1 +00 NNNNN 001 +11
141
142

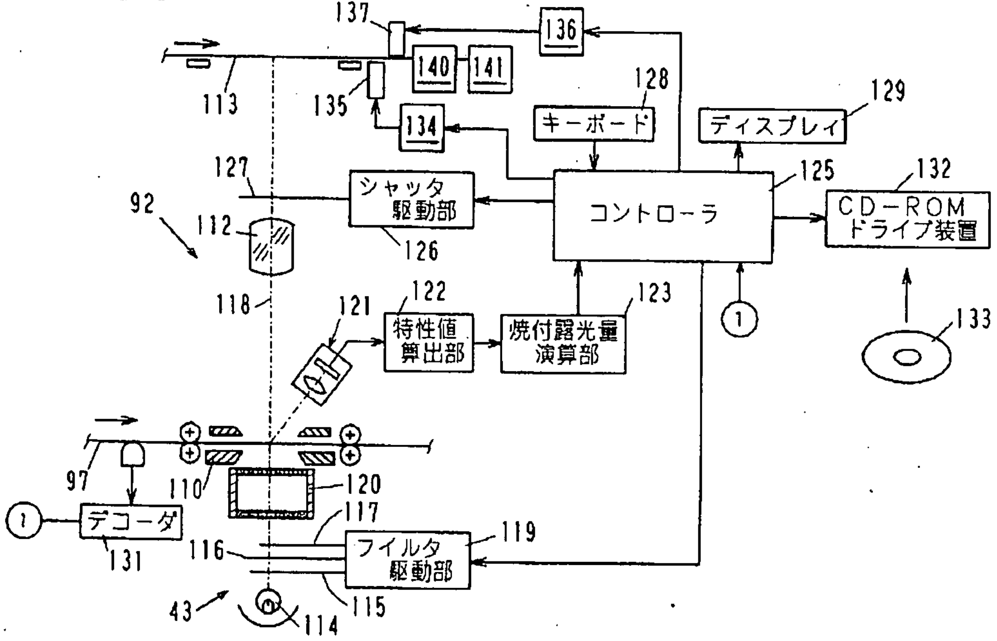
[Drawing 7]


スタート
緯度・経度情報の読込み
地名の検索
主題決定スポット？
NO
YES
撮影レンズの焦点距離所定範囲内？
NO
YES
撮影方位所定範囲内？
NO
YES
地名・主題の決定
地名の決定
次の駒？
YES
NO
エンド

[Drawing 8]


101
オート デート部
102
GPS部
103
撮影方位 仰角検出部
104
撮影データ 発生部
システム コントローラ
ⓐ
100
レリーズスイッチ
93
データ 書込み部
106
105
コード 変換部
98（磁気記録ヘッド）
97（写真フイルム）
90
ⓐ
駆動部
96
95
94
91

[Drawing 9]


137
136
140
141
113
135
134
128
キーボード
129
ディスプレイ
127
シャッタ 駆動部
126
125
コントローラ
132
CD−ROM ドライブ装置
92
112
118
121
122
特性値 算出部
123
焼付露光量 演算部
①
133
97
110
120
117
①
デコーダ
131
116
フイルタ 駆動部
119
115
43
114

[Translation done.]